

B. Specification

Please amend the paragraph at page 21, lines 12-27, as follows:

--The organic compounds, being useful as the carrier, and having a covalent bonding site in the molecule and being capable of bonding an enzyme to the conductive member, and/or the two enzymes include compounds having at least one functional group selected from hydroxyl, carboxyl, amino, ~~aldehyde~~aldehyde, ~~hydrazine~~hydrazine, ~~thiocyanate~~thiocyanate, epoxy, vinyl, halogen, acid ester groups, ~~phosphate~~phosphate, thiol, ~~disulfide~~disulfide, ~~dithiocarbamate~~dithiocarbamate, ~~dithiophosphate~~dithiophosphate, ~~dithiophosphate~~dithiophosphinate, thioether groups, ~~thiosulfate~~thiosulfate, and thiourea groups. Typical examples are glutaraldehyde, polyethylene glycol diglycidyl ether, cyanuric chloride, N-hydroxysuccinimide esters, dimethyl-3,3'-dithiopropionimide hydrochloride, 3,3'-dithio-bis(sulfosuccinimidyl propionate), cystamine, alkyl dithiols, biphenylene dithiols, and benzene dithiols.--

Please amend the paragraph at page 31, line 16, to page 32, line 3, as follows:

--In the drawings, the reference numerals denote the followings: 1, an enzyme; 2 and 6, a mediator; 3 and 7, a carrier; 4, a conductive member; 5, a flow of a charge; 8, a first mediator; 9, a second mediator; 10, a flow of an electron; 11, a potential (the arrow indicates the negative direction); 12, a water-jacketed cell; 13, a cover for the ~~water-jacketed~~ water-jacketed cell; 14, an electrolysis solution; 15, an anode; 16, a

platinum wire; 17, an Ag/AgCl reference cell; 18, an anode lead; 18, a cathode lead; 20 a reference electrode lead; 21, a potentiostat; 22, a gas inlet; 23, a gas tube; 24, a temperature-controlling water inlet; 25, a temperature-controlling outlet; 26, porous polypropylene film; 27, a cathode.--

Please amend the paragraph at page 32, line 12, to page 33, line 13, as follows:

--A commercial silica colloid dispersion liquid (Nissan Chemical Ind.; average particle size: 100 nm) is employed. The dispersion medium of the dispersion liquid is replaced by ethanol. A cleaned gold substrate (1 cm square, 0.3 mm thick, Nilaco) is allowed to stand in the dispersion liquid. The ethanol is allowed to evaporate at 30°C to obtain a porous film constituted of silica spheres. This process is repeated several times to increase the thickness of a porous film constituted of silica spheres (100 nm thick). The film is heated at 200°C for three hours, and then washed with ethanol. In a three-electrode cell, by use of this porous film as the working electrode, a platinum electrode as the counter electrode, and an Ag/AgCl electrode as the reference electrode, electrolytic polymerization is conducted in a solution of 0.1M 3,4-ethylenedioxythiophene and 0.1M lithium perchlorate in acetonitrile at a potential of 1.1 V (vs Ag/AgCl) by control with a potentiostat. The time of the polymerization is controlled by monitoring the electrolysis current profile to obtain a film in a thickness

nearly equivalent to the silica sphere porous film thickness. After the electrolytic polymerization, the film is immersed in a 20% hydrofluoric acid solution for two days to remove the silica spheres to obtain a conductive member (100 μm thick) constituted of electroconductive ~~poly(3,4-ethylenedioxythiophene)~~poly(3,4-ethylenedioxythiophene) containing numerous voids.--

Please amend the paragraph at page 36, line 3, to page 37, line 7, as follows:

--The osmium complex-containing polymer shown by Chemical Formula (3) is synthesized through the steps below. To 6 mL of ~~1-vinylimidazole~~1-vinylimidazole, is added 0.50 g of azobisisobutyronitrile. The mixture is allowed to react in an argon atmosphere at 70°C for 2 hours. After air-cooling of the reaction mixture, the formed precipitate is dissolved in methanol, and the solution is added dropwise to acetone with violent agitation. The formed precipitate is collected by filtration to obtain poly-1-vinylimidazole. Separately, to 1.2 g of 4,4'-dimethyl-2,2'-bipyridine and 1.4 g of ammonium hexachloroosmate, is added 5 mL of ethylene glycol. The mixture is allowed to react in a nitrogen atmosphere at 140°C for 24 hours. The reaction solution is cooled by air, and is filtered to remove impurity. The filtrate is evaporated at a reduced pressure to obtain $\text{Os}(4,4'\text{-dimethyl-2,2'-bipyridine})_2$ dichloride salt. To 200 mL of ethanol, are added 0.13 g of $\text{Os}(4,4'\text{-dimethyl-2,2'-bipyridine})_2$ dichloride salt and 0.20 g of polyvinylimidazole. The mixture is refluxed in a nitrogen

atmosphere for 3 days. The reaction solution is filtered, and the filtrate is added dropwise to 1 L of diethyl ether with violent agitation. The formed precipitate is recovered and dried to obtain the osmium complex polymer shown by Chemical Formula (3). The compound is identified by elemental analysis.--

Please amend the paragraph at page 54, line 26, to page 55, line 3, as follows:

--An enzyme electrode is prepared in the same manner as in Example 3 except that the conductive member constituted of ~~poly(3,4-ethylenedioxythiophene)~~ poly(3,4-ethylenedioxythiophene) containing numerous voids described in Preparation Example 1 is used instead of the gold sheet.--

Please amend the paragraphs at page 66, lines 2-12, as follows:

--An enzyme electrode is prepared in the same manner as in Example 6 except that the conductive member constituted of ~~poly(3,4-ethylenedioxythiophene)~~ poly(3,4-ethylenedioxythiophene) having numerous voids described in Preparation Example 1 is used instead of the gold sheet.

(Comparative Example 43)

An enzyme electrode is prepared in the same manner as in Example 7 except that the conductive member constituted of ~~poly(3,4-ethylenedioxythiophene)~~ poly(3,4-ethylenedioxythiophene) having numerous voids

described in Preparation Example 1 is used instead of the gold sheet.--

Please amend the paragraph at page 67, line 21, to page 68, line 14, as follows:

--Sensors are prepared with enzyme electrodes described in Examples 1-24 and Comparative Examples 1-49. A three-electrode cell (Fig. 6) is used which has an enzyme electrode as the working electrode with a leading wire, an Ag/AgCl electrode as the reference electrode, and a platinum wire as the counter electrode. The electrolyte for a glucose oxidase-employing enzyme electrode is a 20mM phosphate buffer solution (pH 7.2) containing 15mM glucose and 0.1M NaCl. The electrolyte for a D-amino acid oxidase-employing enzyme electrode is a 0.1M pyrophosphate buffer solution (pH 8.5) containing 15mM D-alanine. In the measurement, the respective electrodes are connected to a potentiostat (Toho Giken K.K.; Model 2000), and a steady-state electric current is recorded by application of a potential of 0.5 V (vs Ag/AgCl) in a nitrogen atmosphere. A ~~water-jacketed~~ water-jacketed cell is used as the vessel. The measurement temperature is kept at 37°C by a constant temperature bath. Tables 1(1)-1(3) show the results.--

Please amend the paragraph at page 78, lines 12-25, as follows:

--Electrochemical reactors are prepared with enzyme electrodes described

in Examples 1-24 and Comparative Examples 1-49. A three-electrode cell (Fig. 6) is used which has an enzyme electrode as the working electrode, an Ag/AgCl electrode as the reference electrode, and a platinum wire as the counter electrode. The electrolyte solution is a 20mM phosphate buffer solution (pH 7.2) containing 0.1M NaCl, 10mM glucose, and 10mM D-alanine. In the measurement, a potential of 0.4 V vs Ag/AgCl is applied for 100 minutes in a ~~water-jacketed~~ water-jacketed cell in a nitrogen atmosphere. The formed product is quantitatively determined by high-speed liquid chromatography. Tables 3(1)-3(3) show the results.--